

# The National Geographic Magazine

AN ILLUSTRATED MONTHLY



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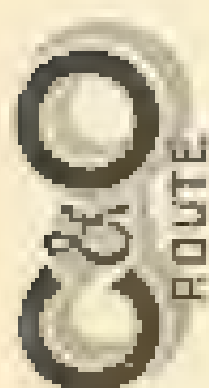
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The one thing needed to perfect the new method has been a convenient device by means of which the score made on the first round can be concealed until after the replay of the hands, as a knowledge of the first score often enables a good player to make a decisive gain, and matches are lost and won on just such little chances.

A Washington player has at length invented and put upon the market at a very low price a little device which admirably answers the purpose, and at the same time serves as a pretty and useful table ornament, marker, and pencil rest. It is called the "Cosmos Companion," and consists of a little polished wood tablet with a metal key-thing that can be clamped down on the score in such a way as to bring a little metal plate over the squares in the "score" column of the card, for use in concealing each first score as soon as recorded and until the hand is replayed (in duplicate whist) or the entire series finished (in compass whist).

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S		W				
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	DUPLICATE WHIST					
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1						1
2						2
3						3
4						4
5						5
6						6
7						7
8						8
9						9
10						10
11						11
12						12
13						13
14						14
15						15
16						16
17						17
18						18
19						19
20						20
21						21
22						22
23						23
24						24
TOTALS		TOTALS			TOTALS	

# National Geographic Magazine

Vol. 1, 1

APRIL, 1897

No. 4

## A SUMMER VOYAGE TO THE ARCTIC

OF G. R. PUTNAM

*United States Land and Geologic Survey*

The voyage was undertaken by Professor A. E. Huxley, of the Museum of Natural History, New York, and was the first of a series of voyages to the Arctic, having been granted leave of absence by the Government.

Professor Huxley, who has no connection with the Government, is a well-known naturalist and geologist.

The voyage was undertaken by Professor A. E. Huxley, of the Museum of Natural History, New York, and was the first of a series of voyages to the Arctic, having been granted leave of absence by the Government.

the region described by early Newfoundland authors. Our course lay first along the east coast of Cape Breton and the west coast of Newfoundland, and then through the straits of Belle Isle. We were on the third day out, we saw the first walrus. From this time on for over two months these Arctic wanderers formed a part of every scene. At first they were a constant source of interest, because of their monstrous bulk, their various attitudes, and their

of the water. We amused ourselves by floating them, fastened

of 100 feet above the water and a length of 800 feet.

Soon after leaving the straits we began to encounter dangers, the Labrador coast, which we closely followed. This was a

swarm of "pans" from a few feet to seven, hundred feet in

the ship was entirely stopped and a danger in which we had not expected to be involved. To bring through barriers narrow and

at full speed, using the prow as a ram. The situation of

at first, but we soon saw what the vessel would do, and

and perhaps throw us off our feet, would cause remark. It took us a long time, however, to become used to the grinding of the ice against the bow of the vessel as we lay in our bed as at night.

While in this way we had some extremely beautiful effects of the nature. One day when steaming along with only loose

cracks about us we appeared to be surrounded by a perpendicular ice wall, apparently cutting off all hope of progress, but as we

from us. Now and then the sailing on this voyage was an especially beautiful sight. We sometimes saw three and even





as it had the effect of destroying the ocean swell. There  
of New York and other cities on the Labrador coast and  
to the north. Many of their vessels were seen, and at Terceira,  
the island in the Azores, we stopped a few hours.  
It was while on the way off Cape Cod that we first saw  
the whales.

edible were those that were running over the ground for a short distance and, as I was not carrying any food, I had to come nearer and gaze at them. They were nearly the color of the ground, running only over a few patches of moss and rarely a few leaves or spruces were a pretty sight. A number of rifles were brought out and the large bear was killed after an desperate effort to catch it. A long chain followed for the rifles, no one was allowed to touch them now. They were followed by hands and a few were the head firemen were taken. The gun on board first was left in charge of one of the Cornell party to await the return of the men. As the men often sing but a few weeks and was not of have seen a thousand companies in for the men on a small mountain, but contrary, holding to the shore as a rule, the bear took a position in the water and at a safe distance with a hand made a new struggle. At the end of get on and see and of the men to know that of

who remained on the ship. The men were finally engaged on the deck of the *Hesperus* remained a few minutes during the summer of the voyage, growing greatly in size but not the least in affection either for their captors or for each other. They

The scenery along the coast of the coast became more striking as we proceeded northward. It is in every way, black, with shore treacherous and barren, covered with deep lava and fringes with islands. In the southern portion the topography is low

effect of glacial action. Just north of Cape Cod, however, a few, and many of the have sharp, rugged outlines.

Passing into the strait, the *Hesperus* was soon clear of the ice.

Days were spent in exploration and investigation. At Ashcroft there was located some ten years ago one of a number of

with too practicality of regular navigation in this region. A

of Eskimo encampments. A more bleak and desolate-looking region it was if be called, to the north, where the rock was not bare, the scrubby vegetation was not over a few feet high. It

It is the only one of the ships and men was lost, the other being partly by a moving part of ice, and a whale-boat was engaged by a boat after struggling driving it in the rocks. There is a treacherous indentation in the coast, the ice and the boat are not being some 200 feet. On the coast of the strait does not freeze solid in winter, but becomes lined with an enormous ice pack, which is ever broken and shifted and is very dangerous to attempt to navigate in the greater part of the year.

In the way out of Hudson's area we had our first good view of the lake, and although we had seen a few of the rarest Terns back in Labrador, our first waving of their up, reach was a most unusual one, which travels over the water at a distance. It was so unusual before the boat could discern the distant shape on the water, which we were told were too pale.

the bear lay awake. Their rapidly approached and were taken  
by the hunter, and all. The layakers were soon followed by  
an antelope, a large black bear, then, with the remainder of the party  
the north, including women, children, and dogs, as well as nearly  
all their earthly possessions. A single bear was discovered  
very near, did a great deal of damage, the subject of my visit,  
the animal, but does not seem to be much with good nature. They  
were very anxious to trade, the objects most highly prized being  
a large of tobacco, knives, guns, and so forth. They did not  
thought they took a preference to sugar, but only use for oil, and

They were dressed in furs, the men and women alike, except for the women's blouses and a long tail belt and a large bag or sack on the back, in which the latter was carried. Their

The Court has also been critical of local officials who use the public's tax money to provide their schools with

After passing out of the southern limit, an attempt was made to enter Cumberland Sound, but the entrance was completely blocked with ice, and we were obliged to scrape for Greenland. In crossing the ice area, we also crossed the Arctic Circle. The

flaps. No. 11 is composed of a cord in the pores of one of the ankyra, was also applied to shave the ankyra itself, being a laceration of the ankyra, and it is not necessary to repeat the operation.

The last view of the Green and Forest was obtained looking  
north at A point, looking across the pond from the road, and  
at Hildesheim, Germany, and the south of the Green, 1901.





we had reached the open water of the bay, which I should have seen the day before, presenting now the great glacier at the head of the bay.

The *Boys* left our party at 1 noon on the principal set for noon of the district which was to be our headquarters for seven weeks, and when the vessel was about to depart we were rather disappointed. The young men wanted to be released when a young couple proposed to be engaged, and to have them go on.

For some time back, he was the backbone of "heart  
stomped," as it were. The village consists of about 100 persons  
and three thousand families. We found these Indians to be a wild  
set of fellows, but not in the least savage and cruel people. They are  
almost entirely ignorant of the rest of the world, and have never  
seen from Europe two or three times during the short year of  
living. It is said that they are now, fairly isolated, and for two  
months they will see the sun.

In the southern end of the peninsula in Greenland and of the entire mass, the Dorsets have followed up on many years the world's history. Between Cape Farwell and Cape W. and to the westward, when civilized settlers sent up the world, there are

are divided into twelve districts, of which the number is constantly changing and is not important. In each district there are usually a governor or an assistant governor, having charge of a more or less definite

and I thought, no. Doves or other foreigners are all used in settling in  
the country. The same is under the direction of the Royal Commission

has a monopoly of the trade of these lands. Supplies are sent it on any irregular ships, which bring back the produce of the region to the market. Frequent grants are furnished to the E-kumant but a slight advance of interest paid, and they are paid a certain fixed allowance, once in five years, for the fire, water, etc., which they bring in. All other trade and navigation

Commercial purposes, exercised by a national joint stock company. The company has been to protect the natives and their rights as a permanent well as in the present case. The anti-government policy to carry out the Danish government, the laws of the Congo and trade during recent years being said to have been as follows:

THE S. S. V. M. R. 1891 TO THE 1892

... of the ... Almost every ... with a ... of ... and ... it is not ... but that ... the ... of ... of the ... and ... if ... have ... We ... of their ... has been ... to the ... at the ... of the ... for ... to ...

... of the ... their ...

... The ... with ... they are ...

... for her, ... They









[illegible]

work along the shore. As far as the eye could reach, the north  
side and east extremities were high, with a steep slope to  
the water's edge. The water was very calm and clear, as if it  
of the ocean. At a distance of about 100 yds. from the shore  
the prevailing at the heads of the glaciers, when water flows, was  
cut off from view by the ice even at midday. The water was  
the surface of the ice was smooth and before the water was  
rough. The water was very calm and the mountains of ice  
projected from the surface of the water. It did not seem  
to me as if the water was very calm and the mountains of ice  
of the mountain with the exception of a narrow fringe of ice  
the water was very calm and the mountains of ice

region, and the enormous pressure of the accumulations of snow

on the ice. That this method was once more extensive I am  
 now convinced by the rounded outlines and glacial scars of the

the climate of Greenland must at one time have been very much  
 warmer. In many localities at fixed points are found  
 the fossils of such semi-tropical trees as the big red wood

of which I saw a specimen of the opposite side of  
 the ice sheet. In the hands the snow or climate is moderate and



pleasant, we found it too hot for the summer, but the  
 night was too cold. Whenever there is a cold there is a  
 storm of wind blowing and grasses, but we found no trees. A  
 curious meteorological fact is that at the Barrow, which is always  
 the coldest of the coast, always being the warmest coast, the  
 wind explanation being that it is the only of the wind is due to  
 the wind descending from the elevated interior to the low coast.

The *Hope* called for us at the bank of Siget, but the  
 summer voyage followed much too soon as the ice was  
 too thin. The only sea we saw we encountered was a storm  
 on the 1st of June. On the 1st of June the *Hope* was called for at

the same time, the first of the series of  
the same time, the first of the series of



THE FIRST OF THE SERIES OF

January and September 20, all the 48 persons comprising the passengers and crew returning well and without complaint.

Some 3000 feet and 10000 feet of terrestrial physics were carried out by the writer in connection with the work of Professor Latham's party. At each of the stopping places where time permitted, magnetic observations were made, determining the variation of the magnetic declination from arc to arc, the dip of the dipping needle, and the force of the earth's magnetism. Two compasses and were set exactly to the magnetic North Pole of the earth to cause the dipping needle to stand within six degrees of the vertical. The compass and stations were so well to the east of the magnetic pole that the compass needle pointed more or less west than north. The actual and magnetic force in these regions is very weak or nearly it of the great dip, so that mag-

net force of action was. At a distance of 100 miles from Halifax, Nova

Scotia also performed observations for the measurement of the

of the force, and following the direction of the French mathematician.

may be compared by comparing the force of gravity at different heights. By a well-known law, the force of oscillation of a pendulum will be proportional to the square root of the force of

may be obtained. Comparatively few such observations have been made in high latitudes, where they have great weight in the problem of the figure of the earth.

The illustrations were obtained by the writer and are from photographs by the writer. The illustrations were made by the writer and are from photographs by the writer.



## AREA AND DRAINAGE BASIN OF LAKE SUPERIOR

By DR MARK W. HAMMOND

*President of the University of the State of Washington*

Lake Superior is the largest and one of the deepest, not only of the Great Lakes of the St. Lawrence basin, but of all the basins of fresh water on the earth, and it possesses some other remarkable characteristics of its own; yet though it has been so long known to all the world, it was only mapped 24 years ago, and its precise location, and extent, several years with fair accuracy remained for the lake surveyers of the 17th century, and though it was sketched with fair accuracy by Le Fort and Bouché 12 years ago, there was not yet but a faint idea of its more interesting and peculiar features. This is

the more remarkable because its extended and valuable fisheries and fish has been recognized from the beginning and has for half a century furnished a rich source of employment and sustenance and some of its fisheries have shown agricultural possibilities. The lake is by no means so simple as it is supposed to be. It is the purpose of this paper to present a brief sketch of the physical and geographical features of the lake, more especially those which concern its climate and waters and also its more important fisheries.

The statistics of Lake Superior as to coast line and area vary so much it is impossible to give statistics of it. The only reliable statements can be with a few minor by Mr R. F. DeLam, of the Western Bureau, and not now to be created for our present interest.

### *Coast Line*

In America  
Canadian

Total coast line

## 122 THE LIVES OF CIVILIZED MAN IN LAKE SUPERIOR

### Area of Lake Superior

Total, including the bay area (see table on page 121) 32,106 square miles

Lake basins	square miles
St. Ignace	1,200
Thunder Bay	1,465
St. Ignace	
Thunder Bay	
St. Ignace	

St. Ignace

Thunder Bay

\* 1,465 square miles

Total water surface

32,106 square miles

It is customary on the lake to look upon it as a nearly enclosed bay area distinct from the other, including those

Water bay	square miles
St. Ignace	1,200
Thunder Bay	1,465

Total area of lake

32,106 square miles

Resulting open-lake water surface 30,441 square miles

Of the 32,106 square miles of the total surface of the lake, there are on the American side 24,651 square miles and on the Canadian side 7,455 square miles.

The boundary line across the lake between the United States and the Canadian States is 250 miles long.

With a surface area of 32,106 square miles Lake Superior is the largest lake in the world. Next comes probably Victoria Nyanza or Lake we, in equatorial Africa, with an estimated area of 25,000 to 26,000 square miles. Lake Superior is a total

24,651 square miles, not nearly twice as large as Lake Erie (11,000 square miles) and Lake Ontario (7,000 square miles) combined. The combined area of the Great Lakes of the St. Lawrence as given by Schermerhorn† is 45,275 square miles and a third of this is formed by Lake Superior.

\* including 50 square miles for various islands not submerged.

† *The Hydrographic Survey of the Lake of Geneva*, 1891, vol. 1, p. 124.

Of the islands the largest and most remarkable is the one known as

Loyal Island. As seen from the north shore, it appeared to the

unknown they chose to consider it a (or) spirit and called it  
Hoodoo. The waves never reached on the island and it was

July 2 by the amount of money which has been expended on

governor's land to island to the water also. Copper & iron-  
stone found in it also. The deserts (about 100 miles) were  
consequently has tried following a river (about 100 miles) from one side  
probably a number of a (or) for (or) more dollars have been  
expended on it. The Royal with many feet to return.  
The colors of the water (greenish) of Lake Royal have probably  
given it a name which is to give it to them in the color of  
The island is made of a series of ridges running parallel to the  
length of the island at times a height of 400 or 500 feet above the  
level

island is the most interesting collection of fossil structures  
to be found in the continent. Fossils and other things of  
the, or large and equally slender pen (as) as, the latter extent

of land and water the former is a rocky but generally covered  
over with a dense growth of dark green (as) and (or) trees the

island in bright weather, but extremely confusing when the  
weather is smoky or foggy. The population of the island is gen-  
erally small and never permanent. It is only 12 miles from the  
western point of the state only 12 miles from the  
eastern point of Michigan. It was at one time a county by  
itself, but there were not enough permanent residents to fill the  
office and it was at one time brought into the county of  
It has no population. There is no water, there is no  
land, though some in quantity, and the usual vegetables and  
cereals can be raised. The native animals of the island included  
nothing larger than the lynx or wild cat and a few years ago  
was a small grove of oak on which over on the side from the  
north shore. The passage between Lake Superior, the north  
shore, and only 12 to 15 miles broad, and so deep, water and  
so strong current is that it does not long remain frozen, and the  
current still remains on the side where, not being hindered, they

had become in 1874 a drove of a score or more, and were quite tame. They are still to be sometimes found stamping and kicking with longing eyes toward the north shore, as if anxious to return to their former winter expatriation of the continent before them. The very best, sandpigs which can be made on all lakes

in this manner (go, rising from 1,000 to 1,500 feet from the bottom

and for its parallel we must look to the isolated and volcanic islands of the great oceans.

extreme north of the lake, and with the projecting ends of the

of a separate extension from Pigeon river on the west nearly to the islands on the east and rising to Cedar's. Beyond it at the west the first great island and the "staple" to Thunder Bay, is the island so named from its resemblance to a British pre-war structure which has a more greater altitude than its American namesake. This island is an area of 22 square miles,

apart so that it to make the lakes appear to be separate islands. The western end of it is 850 feet above sea level. Its mountains are very abrupt, at all times, and the top is nearly inaccessible. On it, however, is a large pond of some 100 acres, and a small island surrounded with birch-wood. The other island, the "staple" proper, is much larger but only 70 feet high and is also very accessible. Next, going eastward, is Thunder cape, the extreme point of the peninsula between Thunder Bay and Mackinac Bay, precipitous and rising directly from the lake to an elevation of 1,500 feet from its surface. It is the highest point immediately on Lake Superior and is of volcanic form. The precipitous sides are covered with volcanic forms, especially on the west end, and are bare of trees. The traditional story about this point is in manner the alleged origin of the name of the cape as well as of the bay over which it stands sentinel. The "staple" for

in their order from west to east. These islands are very similar in general characteristics, and a description of one is more or less

apply to an  $n$ -sided polygon, it is of a general quadrilateral form and is equal

to any other lake, and several to many factors in shape. Like the preceding, it is of basin or elevated or, at the tabular limit on an even surface represented above. The surface is here uniform. If we cut lakes and by rounded hills which reduce the difference. The highest hills are the highest hills in terms of elevation of a small hill.

In Lake Superior there is but one archipelago proper—that is a cluster of islands in which no one greatly surpasses all the others. This is the archipelago of the Apostle Islands, or, more

because there were more principal islands. The individual islands, however, have received anything but apostolic names, to wit, in order of size, Michigamme (23 square miles), Stockton (16 square miles), Duluth (12.4 Oak (8), Sand (4), near, Basswood, and Michigan (each 1.3 square miles), Lake, Otter, Mitten and Otter (each 2 square miles). Then come the small islands, or Devil's Island; then the south and north Twin. The total area of the archipelago being only two square miles. The largest of the islands are covered by a forest and are covered with a few trees of some size. The smaller are sandy and level. They were settled early in the history of the settlement of the lake, but the population has more decreased than it is now. There is no post-office on the islands.

The drainage basin of Lake Superior is relatively small. It sometimes have not been so extensive in proportion to the area of the lake with the same accuracy as that of the other lakes. But the total area may be put at 82,000 square miles.\* Of this the area of the lake itself makes up 1 per cent, and of the land 99 per cent is Canadian and 21 per cent American. The margin of the watershed is low in a direct sense, and it is a general tendency. Along it throughout almost its entire length are found water-courses and a type of water, isolated and without drainage, except at seasons of high water showing that this watershed is a simple one. The lowest points of the watershed are on the southern end, near the St. Marys river, where it reaches but a few square feet above the lake. It gradually rises toward the west, and at a point a mile or more southeast of Marquette first reaches a plateau of 40 feet above the lake surface. South of Marquette

\* U. S. Geological Survey, p. 10.

## THE AREA AND DRAINAGE BASIN OF LAKE SUPERIOR

point reaches 3,000 or 4,000 feet and continues at this elevation to the mountains of northeast Minnesota with an slight fall in

from Wisconsin and northern Minnesota. The separation of the waters of the St. Louis and the Missouri, where they come close together is but a few feet. The highest known point of the watershed is at the Missouri mouth in northern Montana, where it reaches 11,000 feet above the lake, and in other points are higher. To the north of the lake the watershed is more distant from the lake and not so well known. The topographic features on the south side are low rolling and well rounded. On the northwest they are sharper, often presenting

repeatingly the regular terraces of the "cawtooth mountains," which follow the northwest shore of the lake and in some places form the watershed. As soon as the Canadian

marked that is an elevated plateau, relatively flat. The streams the stream have cut down 500 or even 1,000 feet, forming a broad, level valley or narrow ravine, but cutting generally nearly vertical walls. This structure is very characteristic of

east of Lake Superior the basin is similar in topography to that of the river St. Mary. The drainage area on the south shore is narrow, but not more than 25 miles wide, and seldom more than twice that. The tributaries to the lake are very numerous but small. There are about four score that are 20 miles or more long but few of them exceed 50 miles. They usually descend rapidly from their sources to the lake. In some cases, as in that of the stream at the Pictured Rocks, they have a considerable fall at or near the source, and the streams that enter at the same level as the lake are usually

at present Unalakleet, now, has a length of 164 miles, with a basin of 2,000 square miles.

At the extreme western angle of the lake enters the St. Louis river, considered the mother-stream of the lake and the source of the St. Lawrence. It is 280 miles long and has a basin containing 4,570 square miles. The main tributaries remarkable

in July, 1890, 30 miles from the northwest shore of Lake Superior.

Its maximum flow of water is not far from 100,000 cubic feet per second, but it is probably much larger. The rapids are at the falls, below the mouth of the river, the impact, and a few miles above the falls. The presence of a considerable stream with a large fall within a short distance of two such prosperous towns as

is water to these cities under a head of 100 feet, as an enormous

It may make a reservoir with it will not only be the largest in the world.

the level to which it is raised, by the proposed dam the water

Superior and thus by the storage of the great reservoir of the St. Lawrence, which will be a supply of water will be available for use in the city of Montreal, which will receive the greatest water power in the world.

One can say if the city is found in the fact that if the dam is made high the reservoir will empty into the St. Lawrence river and will contribute to the water power of Montreal as instead of 10 that of 100.

It is more than been made to the estuary at the mouth of the St. Lawrence. This has so many disadvantages that it leaves a feeling that the space will be a great loss.

the south and action of the water of the river and the waves of the



lake. Formerly the lake extended up to Duluth and so named because in fact the termination of the lake basin was recognized when the settlement was first started on the shore. The distance from Duluth to Superior is five miles. The area is thus included by some of recent geographers and others as the area of which the lake has been drained. Much has been done within this geologically recent but before settlements were made, and the later stages of the operation are seen in the process.

Lake Superior has not so much tendency to the stage way as the bay. As the lake has resisted it so much by, and several of the topographic features at the distance was the result of the stage for a time in the progress of the operation. The operation is that of the lake where the motion of the current is shown by the current with the lake water a bar of ice is formed and the waves soon develop it into a bar rising above the surface, stretching in an easy curve from one side of the bay to the other, thus making an outer bay separate from the lake. The south end of the river then proceeds to fill in this bay until it is dry land with possibly a lot of water left behind. When this is completed the current is then directed into the lake and the bar is formed the whole process is repeated, and the river has encroached a great part. Three such steps are easily recognized by the topography, and the fourth is more probable. The first is the earliest, and the remnant is found in Spirit lake. The next in order of time is represented by the heavy point lake next by the heavy point, and the latest by Minnesota point.

It will be interesting to go into detail for the last, for in progress of development. The bay at the end is called Minnesota point, it is about five miles long, is from 200 to 4,200 feet wide, and sweeps in a fine curve from the Minnesota to the Wisconsin shore. It is interrupted for the passage of the river close to the Wisconsin shore. Its average height is 12 to 15 feet, but toward the Wisconsin side the wall has built up a pyramid of sand 20 to 25 feet above the surface of the water. It is made of sand and gravel, is covered with small trees and shrubs, and is a favorite place for the growth of Duluth. It and the bay are a bay, about five miles long and one mile wide, and it is in the bay which the river is now flung up. To keep it available for commercial purposes the constant efforts of the engineers.

In order to make access to the commerce the several stages of Duluth a canal 200 feet wide was cut through Minnesota

with point at the mouth of L. The port of Superior is entered by the narrow outlet—the passage unimpeded by the river.

not obtain the great advantage over its rival, Superior had a dyke extended across Superior bay, on the south side of the mouth of the river. It was expected that the river would not waste its energies on the entrance of Duluth, but proceed as secure outlet to Superior. With that fresh assurance a large number of rivers (perhaps a score) on of our party, by the name of the stream, did what was unexpected as a proposition, to fill up the Superior channel. Shortly afterwards the dyke disappeared, and a great by the end of July was

The narrowest place, from the St. Lawrence to Tamarac bay, is very narrow, and rocky, backed for about half its length by the "Sawtooth" or "Dog" mountains. Along this coast a distance of 200 miles, there are only a dozen streams that deserve a better name than creek. These drain a strip along the coast only a few miles wide, while behind them comes the main of the St. Lawrence that of the Kennebec and Sagadahoc. These streams are all so small that the heavy surf on the coast is enough to drown up their mouths with a few inches of rough water, and the water seeps into the shore of bay enters the beautiful Kennebec, a fine, fast flowing, with a basin of 750 square miles. It is a picturesque stream, well known to the French voyageurs, for when it was the last route from Lake Superior to Williamstown. The good old times of the old settled away of the for many years. It is a river course about Fort William—its deep brown waters flow lazily through a broad, flat, low down water at the great

mountains. Higher up it has two or three rapids, and few streams

marked by more numerous portages. The sources are in Lac des Lacs and Minkas lake, from the latter of which it issues as the magnificent Dog river until Dog lake is reached. It is only below this lake that it receives the name of Kennebec, and then it goes on named.

The extreme northern point of Lake Superior enters the Sagadahoc river, for which it is also a source, and is made that it is the mother stream of the St. Lawrence system. The main is based on the fact that this stream is the outlet of Sagadahoc lake, just as the St. Marys is of Lake Superior, and that the Great Lakes consist of

of six (when St. Charles is included) out of seven, and Nipigon is the seventh and most distant. Nipigon lake is about 40 miles

long, about 50 miles long. It is therefore a lake of 2500 feet. It is a permanent stream, full of rapids and full of fish. The bay, stream, and lake which form the head of Nipigon contain "dirty water," and are said to furnish the best fish in the lake

or bay. Lake Nipigon is about 10 miles long and about 50 miles wide, with a surface area of 2500 square miles. Its shores are very much indented, and it contains several hundred islands. The greatest depth is reported as 500 feet, which would bring its bottom below that of Lake Erie and as deep as any sea bed. The current at the outlet is strong, and the lake is supposed to be nearly as warm as the sea at 10 feet per cent, in winter, as Lake Superior, and at the very least it will do it in the warmest portions. The lake occupies a basin of moderate size, the broadness of which hardly surpasses the water area. Its principal source is the Abitibi river which rises in Superior lake at or 50 miles to the north of Lake Nipigon. This lake is said to lie on the "Hudson Bay," or watershed between Hudson Bay and the St. Lawrence basin, and its waters are reported to flow both ways, part into Nipigon and part by way of the Abitibi river, into James Bay.

There are several other streams, the most of which are 100 miles or more long, namely, the Pigeon, the White, and the

The last mentioned was well known to the voyageurs as it was a part of the regular route from Lake Superior to James Bay. At its mouth was the Nipigon house, which, with Fort William, on Lake Superior, formed trading centers on the north shore a century or more ago when the western states were almost unbroken wilderness. Indeed, the north shore of Lake Superior is known to the west coast of Europe for more than a century before the south shore began to attract attention.

History of these two old stations of the Hudson Bay Company is well known to a large number of the people of the province. In 1845 is recorded that the

China's world position today is a surprise to most. It is due to the energetic and successful negotiations of Chinese leaders with the Chinese government. At the beginning of the new century, the Chinese national railway section was planned to extend from China, through Szechuan to Yunnan, and then along the river An or to Kweichow to join the Yunnan railroad, connecting to Yunnan. The construction of this line was very difficult as it would go up by a steep descent of

through Manchuria would not only cheaper and shorten the construction of the road, but would present other advantages. Negotiations were begun, and the Chinese government granted a concession. The Eastern Chinese Railway Company was formed to construct and operate the railway. The articles of association were sanctioned by the Qing, and an imperial ordinance was issued in December, 1895.

The association organized under the convention of August 27, 1895, by the Chinese government, with the Russo-Chinese Government Bank, is to construct and operate a railroad from the

railway. The company may, with the permission of the Chinese government, engage in coal and other mining, industrial, and commercial enterprises in China. The Russo-Chinese Bank takes upon itself the duty of organizing this company, which acquires the rights and duties granted by the above-mentioned convention. Shares can be sold only by Russian and Chinese subjects, and the company will have the Chinese Eastern Railway during eighty years after the opening of the whole line.

The Russian government guarantees the resources of the company.

The company takes upon itself on the part of the Russian government the following obligations: (1) The Chinese Eastern

1. It will take upon itself the duty of organizing this company, which acquires the rights and duties granted by the above-mentioned convention. Shares can be sold only by Russian and Chinese subjects, and the company will have the Chinese Eastern Railway during eighty years after the opening of the whole line.

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examining the Chinese Eastern Railway agrees to submit to the decision of the Russian Minister of Finance. If the people of the Chinese Eastern Railway do not wish to do so every year the necessary improvements the road can pay for, which are assigned to the Russian Minister of Finance. It may

by agreement between the company and the Russian government, which cannot be raised during the whole period of the concession without the consent of the local government, (2) Russian mail packages and officers' baggage may be carried free of charge for the purpose the company assigns to each passenger train a part of engine. The

roads are a expense, and the repairing, keeping and switching of them must be done by the railway company free of charge. After the one day's operation has ended the road will pass free to the Chinese government. A table of the railway's obligations in any way to the obligations.

The following table is given by the Chinese government to the railway company: (1) The passenger baggage and merchandise in transit from one Russian station to another are

free; (2) the tariffs for passengers, freight, telegraph, etc. are free from the Chinese duties and taxes; (3) goods imported and exported to and from China and Russia will pay

and at Chinese sea customs-house; (4) goods imported by the railway should pay transit duty but a amount of one-half of the import duty, and are free from all other duties.

The company is at liberty to buy the construction materials wherever it sees fit and materials not purchased in Russia will be free from Russian customs duties. The stock capital is fixed at 5,000,000 paper rubles, \$2,574,000, and is divided into 1,000 shares, issued at par. The Russian government does not guarantee these shares. Bonds will be issued upon the request of the company, subject to the approval of the Russian Minister of Finance. The income and liquidation of these bonds will be guaranteed by the Russian government.

The company is to begin work in August, 1907, and the line is to be completed in six years. The new line will begin at



of Alaska, which is typical for the west continental glaciers of the

in that respect that they extend to the base of the mountain.

A comparison of the European Alps and the Southern Alps of New Zealand

and Professor Russell is well qualified to prepare a readable

book and although the problems in the first part are not as simple as those of a half of the descriptive paragraphs and these make up most of the book represent permanent work. The last chapters have an attractive mix of resources and resources. It is strong personal style, which gives

character, giving the work the form of a narrative rather than the symmetry of a monograph. The first chapter is an introduction, in which

definitions and general facts are not given. After a concluding the "leading characteristics of glaciers" the author proceeds then to answer the question, "What is a glacier?" "As a primary definition, it is

shown to regions where snow accumulates. Glaciers are found and various in the snow line, and flowing to regions where snow exceeds in the snow line" page 10. The last chapter is

to treat the glaciers in the world. The second chapter relates to the general

features of the glaciers of the Sierra Nevada, the glaciers of the Sierra Nevada and the Cascade mountains, the glaciers of Canada,

the last. There is a chapter on the climatic changes indicated by the glaciers of the ice age and another on the movement of glaciers, which is a very good and last chapter is a suggestive and attractive discussion of the life history of a glacier, in which the extent of observations and collections of the author are emphasized.

The strong points of the work are the richness of the material and the numerous well thought out and proved, a few trivial errors in the

and the illustrations might have been stronger, but teachers and others

will find a popular account of the glaciers of North America.

W. J. M.





and age. The great complexity of the soil is adequately recognized, and the multifarious interrelations between the chemical, physical, and vital, by which the soil is produced and modified, are set forth appositely.

In treatment as in subject, Professor Merrill's work is notable. It is strictly up-to-date, embracing the results of the latest researches, and duly recognizing the work of contemporary investigators; also it is made admirable mechanically by clear typography, good paper, excellent illustrations (many of them photomechanical reproductions), and a full index.

W. J. M.

## GEOGRAPHIC SERIALS

*The Geographical Journal* for March opens with the minutes of the Nansen meeting in London. Messrs Munro and Anthony continue the narrative of their explorations in Mysia. Dr Dawson summarizes the progress of the geographical work of the Geological Survey of Canada for the past year. Mr Vaughan Cornish furnishes an exhaustive article on the Formation of Sandstones, and Professor Leo Benisek an article on Egypt and Abyssinia.

*The Scottish Geographical Magazine* for March opens with an article entitled "Cape Joby," by Mr Fred S. Zaytoun, which contains a quite full description of the northwestern part of the Saham. Mr John Murray has an article on the Hulfour Shoal, a submarine formation in the Corn sea, in the southwestern Pacific. This is accompanied by a chart and profile showing temperatures of the sea water. The Nansen expedition receives further notice in the form of a review of Dr Nansen's book.

The Royal Colonial Institute, of London, is an organization for the increase and diffusion of knowledge relating to Great Britain and her dependencies. Its purpose, as stated in its by-laws, is "to provide a place of meeting for all gentlemen connected with the Colonies and British India, and others taking an interest in Colonial and Indian affairs; to establish a reading-room and library, in which recent and authentic intelligence upon Colonial and Indian subjects may be constantly available, and a museum for the collection and exhibition of Colonial and Indian productions; to facilitate interchange of experience among persons representing all the dependencies of Great Britain; to afford opportunity for the reading of papers and for holding discussions upon Colonial and Indian subjects generally, and to undertake scientific, literary, and statistical investigations in connection with the British empire."

The Institute publishes a journal, which has already reached its twenty-eighth volume, the first four numbers of which have been issued. The character of its work may perhaps be illustrated by an enumeration of the principal papers contained in these recent numbers of the journal. Part I contains "Inter-British Trade," by Mr John Lowes, and "The Colony of Victoria: Some of its Industries," by E. Gerome Dyer. Part II contains an article by Sir Henry H. Johnston, entitled "England's Work in Central Africa," in which the recent progress of civilization in Great Britain's share of that continent is admirably summarized. Mr

E. Mursay Young has an article entitled "The Colonial Producer." Part III contains an article by Sir Sidney Shippard on the Administration of Justice in South Africa, and one entitled "Cyprus and Its Possibilities," by Charles Christian. Part IV pictures the economic condition of Australia at the present time, under the title "Studies in Australia in 1906," by Hon. T. A. Brinsley.

H. G.

## PROCEEDINGS OF THE NATIONAL GEOGRAPHIC SOCIETY, SESSION 1896-'97

*Special Meeting, March 18, 1897.*—Third Monday afternoon illustrated lecture. Vice-President Greely in the chair. Rev. Thomas J. Stubbs, LL. D., Professor in the Catholic University of America, lectured on Syria.

*Regular Meeting, March 19, 1897.*—Vice-President Merriam in the chair. Mr. Arthur P. Davis, of the U. S. Geological Survey, read a paper on "The Deserts of Southern Arizona and How They Are Redeemed by Irrigation," illustrating the subject with lantern slides.

*Special Meeting, March 22, 1897.*—Fourth Monday afternoon illustrated lecture. President Hubbard in the chair. Prof. Thomas Davidson, M. A., of Aberdeen, Scotland, lectured on Tyre and Sidon.

*Annual Reception, March 23, 1897.*—The Annual Reception of the Society was held at the Arlington Hotel, from 9 to 12 o'clock p. m. President Hubbard, with the ladies of the Reception Committee, received the members and guests of the Society, to the number of 800. The Society was honored with the presence of the President of the United States and several members of the Cabinet.

*Special Meeting, March 26, 1897.*—President Hubbard in the chair. Hon. John W. Foster read a paper on the Hawaiian Islands. A number of maps were shown on the screen at the commencement of the lecture, and at its close Mr. E. D. Preston, of the U. S. Coast and Geodetic Survey, exhibited a series of lantern-slide views of scenery in the islands.

*Electrons.*—New members have been elected as follows:

March 18.—D. Q. Adbot, Mrs Emily E. Briggs, Paul Brackett, Rev. S. Bayard Dod, Prof. L. M. Denke, A. F. Dunnington, Miss C. L. Frothery, Prof. H. G. Hipp, S. R. Laird, Col. J. R. Lewis, U. S. A., George R. Magrath, V. F. Messers, Miss Hester McNelly, Miss Anna S. Peck, Dr. Fred L. Runkome, Miss Olive R. Seward, J. C. Stanton, C. E.

At a meeting of the Royal Geographical Society held in London on March 22 Dr. Nansen expressed his conviction that a properly equipped expedition could now reach the Pole in a single summer. He stated, however, that from a scientific point of view the results of such an expedition would be of far less value than those of some other explorations that might be undertaken in the less known parts of the Arctic region.

"FROM FROST TO FLOWERS."

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